**Lab 5 – Counting**

***The lab introduces the a simple concept of counting with the Arduino. Since it’s a computer, it should count very well, never missing a beat. It should also count quite quickly when you want it to. Counting is generally used to repeat a segment of code a certain number of times. It’s tricky at first, but it will become easier with time.***

**Hardware Required**Arduino Board LED (2 total, different colors)  
 **Circuit**

Just like *Lab 2 – LED*, connect an LED to pin 13 and the nearest ground. Now that your circuit is complete, lets learn how to program it.

**Basic Code Explanation**

In the program below , the “for” statement simply sets up a condition where it checks the value of an integer (labeled “i”)every time the program “loop” cycles through. When “i” is less than the number (sample code says 10), it increases the value of i by 1.

**Directions**

Run the code, and follow the directions in the “*Modify the Program”* section.

Sample code

------------------------------------------------------------------

*#define ledPin 13 // The compiler will replace any mention*

*// of ledPin with the value 13 at compile time*

*void setup() {*

*pinMode(13, OUTPUT);*

*}*

*void loop() {*

*for (int i=0; i < 10; i++) // for (initialization; condition; increment)*

*{*

*digitalWrite(13, HIGH);*

*delay(100);*

*digitalWrite(13, LOW);*

*delay(100);*

*}*

*delay(5000); //notice how this delay is outside the loop {}*

*}*

------------------------------------------------------------------

Once the program works, observe its behavior. Obtain the instructor’s initials here (\_\_\_)

**Modify the Program**Change the delays within the loop to small numbers and observe the new program. (\_\_\_)  
record your delay values here:

Create a program which displays counter value on the serial monitor. (\_\_\_)  
Refer to lab 4 for a refresher, or use the web to help you.

What do i++ and i-- stand for?

Put the Led back, and create a Police light using two Leds. Each light should blink 10-20 times before switching. Use a high on/off rate to simulate the light correctly. (\_\_\_)

Revert to your original program and swap the Led for a piezo speaker. Change “*i <10” to “i < 100”* and change each loop delay to *1ms*. Leave the last delay at *5000ms* for now. What happens to the speaker?

Change the numbers and observe how the sound changes. (\_\_\_)

If you put the Led in place of the speaker, what happens? (\_\_\_)

List five items in or around your home which repeat a certain number of times. Clarify answers.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
5. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Information for this lab was borrowed from: <http://arduino.cc/en/Reference/For>